THE JOURNAL OF GEOGRAPHY

VOLUME X NOVEMBER, 1911 NUMBER 3

THE PRESENT STATUS OF GEOGRAPHY TEACHING

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WITH the purpose of investigating the present status of geography teaching, one hundred questionaires were sent out to obtain the opinions of geography teachers and authors of geography texts concerning the content of geography and the aims and methods in teaching it at the present time.

Eighty-five of the questionaires were sent to the *geography departments of Normal schools* all over the United States. The remaining ones were sent to the authors of geography text books or to prominent geographers.

About forty-five replies to the questionaire have been received and the per cents in the summary have been worked out on the actual number of replies to each question.

The following gives a brief outline of the questionaire:

1. The courses offered in geography
2. The length of time devoted to geography
3. Aims
   (a) The chief purpose of teaching geography and its practical value
   (b) The emphasis placed upon the causal element in geography
   (c) The phases of geography that should receive especial attention
4. Content
   (a) Subject matter that should be eliminated and other subject matter that should receive more attention
   (b) The use of periodical literature
   (c) The value of observational and laboratory work and map drawing
5. Method
   (a) The methods used in teaching geography and their advantages
   (b) The greatest mistakes in present day geography teaching
   (c) The extent to which note-books, sand tables and relief maps are used in the grades

The following is a summary of the answers to the questionaire:

1. *What courses are offered in geography in your school?*

86 per cent of the schools offer courses in physical geography vary-

ing in length from twelve weeks to one year. 73 per cent give courses in regional or general geography and these courses also vary in length from twelve weeks to one year. 60 per cent of the schools offer courses in methods. 57 per cent of the schools have commercial or industrial geography courses. Several schools offer courses in advanced geography; other courses mentioned are mathematical, historical and social geography.

2. *What is the length of time devoted to geography in the grades? In the Normal school?*

The time devoted to geography in the grades varies from two to eight years, the average length of time being five years. Most of the schools offer either four or five years. 23 per cent offer four years. 20 per cent devote five years to geography and 14 per cent offer six years. Three schools offer eight years, one school offers two years, another three years and another seven years. The second grade is the lowest in which geography is begun with three exceptions. It is usually begun in the third or fourth grade and continued through the seventh or eighth.

60 per cent of the Normal schools offer courses in methods varying in length from ten weeks to four years, the average length of time being 28½ weeks. 39 per cent offer one year or more in the methods course and 17 per cent give elective courses in the Normal schools.

3. *What time is devoted to the teaching of each continent in the grades?*

41 per cent of the schools place the most emphasis on North America and Europe. 35 per cent give an equal amount of time to each continent, the time varying from one-half a year to two years. In several of the schools the continents are studied once and reviewed. One school emphasizes the United States and Europe, and another places the most emphasis on North America, giving the other continents the same emphasis. In another school, geography is not studied by continents but by topics such as cities, railroads, etc.

4. *Is geography receiving sufficient time in the present day course of study?*

54 per cent state that geography is not receiving sufficient time in the course of study, while 31⅓ per cent think that it is. Four think that it is receiving sufficient time in the grades but not in the high school. One person states that it is receiving sufficient time but not giving sufficiently good results.

AIMS

5. *What is the chief purpose of teaching geography?*

45 per cent of the replies state that the chief purpose is to give insight into environmental relations. 45 per cent also think that one of the chief purposes is to give a fund of knowledge. 26 per cent state that it develops the reasoning power. Several give each of the following as one

of the chief purposes; it has a cultural value, develops the imagination, and makes intelligent and appreciative citizens. Other purposes stated are that it trains in observation and the use of maps, promotes human sympathy, makes the child at home through knowledge as well as feeling, has an economic value, develops a scientific attitude of mind and cosmopolitan spirit, and gives a background for other elementary studies as reading, history, science, art and travel.

6. *Of what practical value is it?*

34 per cent state that it is of practical value in all industries, trade, commerce, travel, business, government work, etc. 39 per cent state that it assists in intelligent reading, in the understanding of current events and enterprises, and enables the pupil to understand present day world relations. Several think it develops the reasoning power.

7. *As you teach geography where do you place the more emphasis; on the knowledge of facts, or on the knowledge of relationships?*

11 per cent place more emphasis on the knowledge of relationships. 28 per cent place the same emphasis on each. Only one places more emphasis on the acquisition of facts. Several place the emphasis on facts in the lower grades and increase the emphasis on the knowledge of relationships through the grades.

8. *To what extent in the different grades should the causal element enter into the teaching of geography?*

62 per cent present the causal element to some extent in the lower grades and increase it up to the eighth grade, putting the higher grades almost entirely upon that basis. 31 per cent give it constant emphasis throughout wherever possible. 6 per cent give the causal element very little emphasis in the grades.

9. *Upon what phase or phases of geography do you think especial emphasis should be laid?*

40 per cent place the emphasis upon the influences of environment upon man and industries. Several place the emphasis upon the industrial and commercial phases with the physical or climatic conditions affecting them. Other phases emphasized are map reading (ability to deduce all essential geographic facts from a good map), effect of physical or political relations of geography to the sciences and history, on sociological and agricultural geography, on the geography of the United States, on the industrial and the descriptive phases.

CONTENT

10. *It is possible to eliminate part of the subject matter ordinarily included in the teaching of geography? If so please suggest what may be eliminated.*

23 per cent would not eliminate any of the present day subject mat-

ter. 77 per cent would eliminate a part of the subject matter. 33⅓ per cent would eliminate the memory work and many of the details of less important character such as details of physical features and unimportant locational material. Map questions as such might be eliminated and also the geological and astronomical phases. Several suggest the elimination of mathematical geography.

11. *Can you suggest subject matter that should receive more attention or that should be added to the course?*

23 per cent would place less emphasis on unrelated facts and more upon the geographical principles and relationships. 19 per cent would emphasize the commercial, industrial and social phases more.

12. *To what extent do you use periodical literature in the teaching of geography?*

59 per cent report that periodicals are referred to constantly and used extensively. It is used as supplementary material and topics are reported on frequently. 12 per cent use it whenever possible when helpful articles are found by the teacher. Several think it is very valuable and should be used more. Only two report that they do not use periodicals much. Periodicals keep classes in touch with the geographical activity of the day and can be used as reference and picture study work.

13. *Should a closer correlation be made between geography and the other studies? If so how may it be accomplished?*

94 per cent think a closer correlation should be made between geography and the other studies. Only two thinks that a closer correlation should not be made between geography and the other subjects. 58 per cent mention history as a study that should be more closely correlated with geography. This may be done by the use of maps, and showing the effects of geographic conditions on historic events. Several think a closer correlation should be made with the sciences as botany, biology, nature study and physics.

14. *What constitutes a wise use of text-books?*

58 per cent think the text book should be used as a guide and reference book, making it the basis or center for grouping broader information. Several suggest that a wise teacher is needed. The pupils should be responsible for definite matter in the text and the teacher should be able to supplement it. Others believe there should be thorough drill on the important points and light touches on the details.

15. *What value do you place on laboratory work in connection with the teaching of geography?*

73 per cent of the replies rate the laboratory work as being fundamental and very valuable. It makes the work concrete, expands and applies the text and trains the reason. 19 per cent think it is of little value. One thinks it is essential where it represents a spirit of investigation.

16. *If laboratory work should be done, what kind of laboratory work?*

61 per cent suggest map construction both the rough sketching of outline maps and the making of relief maps, using salt and flour, sand, and clay as material. 26 per cent mention the construction of land forms using sand and clay modeling. 42 per cent suggest work with apparatus, such as experiments in developing principles—winds, erosion, rainfall and air pressure as acting on the barometer—weather observations and weather map reading. 23 per cent suggest the study of specimens, minerals and exhibit collections. 23 per cent mention field work.

17. *What is the value of map drawing and what proportion of time should it be given?*

62 per cent think map drawing is of great value in fixing outlines, directions, form, location, distance, and space relations; some think that more time could profitably be given to it. 32½ per cent are not in favor of the perfectly finished map that takes much time but think the rough sketches or memory maps very valuable. Memory maps are of value because they compel thought. One or two perfect maps may be made a year but the rest should be rapid sketches. Several use printed outline maps, and have them filled in to show rainfall, products, etc. This teaches map interpretation.

18. *To what extent do you make direct use of the industrial life of your community?*

80 per cent use the industrial life whenever possible, visiting the shops, factories, mills and stores. Some of the work in the lower grades is based upon the industrial work. 16⅔ per cent do not use the industrial life very much and do not seem to be very much in favor of it.

19. *Do you by direct observation study the physical features of your neighborhood? Is such work regularly and systematically done?*

84 per cent study the physical features of their neighborhood and do the work regularly and systematically. 16 per cent do the observational work but not regularly and systematically. They think it is important and that more of it should be done.

20. *What apparatus do you consider necessary in the teaching of geography in the common schools?*

90 per cent think good maps of all kinds are necessary; 84 per cent, globes; 33⅓ per cent, modeling materials, sand trays, clay, etc.; 23 per cent, pictures; 20 per cent, specimens and industrial exhibits; 15 per cent supplementary books. Several suggest atlases, lantern and slides, charts, planetarium, thermometer, barometer, air pump, and contour maps.

21. *What method do you use in teaching geography; text-book, lecture, development, or other method?*

65 per cent use combined methods. 21 per cent use the development

method. 15 per cent use the text book method combined with some other method. One combines it with the lecture method, another with lecture and laboratory work, and several combine it with the development method. No one seems to be in favor of using the lecture method in the grades. Two use the text book method.

23. *In your opinion what are the greatest mistakes in present day geography teaching?*

47 per cent state that the greatest mistakes in geography teaching are failure to teach causal relations and make the subject real by connecting it with the world outside. 25 per cent state that there is too much text book slavery, and use of dry, uninteresting material. 25 per cent reply that there is no special preparation for teachers, and they do not realize the great central thought in the subject. Other answers given are that there is too much memorizing, too little time for geography, lack of aim, failure to cover the work systematically and too little emphasis on locational geography.

24. *To what extent do the pupils in the grades keep note-books?*

52 per cent report that the note-book is kept to some extent, especially from the sixth grade on. They are used to keep observation notes, work not covered by the texts, book of outline maps and outlines for review. Only one school keeps note books in all grades. 48 per cent keep little or no note book work and do not seem to be in favor of doing it in the grades. Only two think more note-book work should be done.

25. *To what extent do the pupils in the grades use the sand table?*

60 per cent use the sand-table quite a little especially in the primary grades. They use it to model continents and to express physical features. 39 per cent use it little or none at all.

26. *To what extent do the pupils in the grades use relief maps?*

44 per cent use the relief-maps quite extensively. 32 per cent use them to a slight extent. One person prefers pictures of relief maps to the maps. Another uses only color relief, as he thinks the actual relief too grotesque.

Clay, sand, paper, putty, and salt and flour are the mediums used.

CONCLUSIONS

The following conclusions may be drawn from these answers:

The courses most generally offered in geography in the order of their importance are physical geography, regional or general geography, methods in geography, and commercial and industrial geography.

In the grades the average length of time devoted to geography is five years. It is usually begun in the third or fourth grade and continued through the seventh or eighth. With a few exceptions the second is the lowest grade in which geography is begun.

The average length of courses in methods is twenty-eight and one-half weeks and over one-third of the schools offer one year or more.

The majority of schools place the most emphasis on North America and Europe when teaching the continents. About one-third of the schools devote an equal amount of time to each continent, the amount of time spent on each continent varying from one-half a year to two years.

It seems to be the general opinion that geography is not receiving sufficient time in the course of study.

The chief purpose of geography teaching is to give insight into environmental relations and to give a fund of knowledge. It also develops the reasoning power. It is of practical value in industries and commerce and assists in the intelligent reading and understanding of current events and enterprises.

The majority of teachers are placing the most emphasis upon the knowledge of relationships instead of upon the mere acquisition of facts. The causal element is only used to a small extent in the lower grades and increased up to the eighth grade, putting the higher grades almost entirely upon that basis.

The phases of geography that are being emphasized most are the influences of environment upon man and industries. Many are in favor of eliminating the minor detail work and placing more emphasis on the commercial, industrial and social phases, and the geographical principles and relationships.

Periodicals are used quite extensively as supplementary material.

Nearly all are in favor of a closer correlation of geography with the other studies, especially with history. It can also be easily correlated with the sciences and literature.

The text in geography should be used as a guide and reference book, making it the basis or center for the grouping of broader information.

The laboratory work is very valuable, it makes the work concrete and applies and expands the text-book. The kinds of laboratory work receiving most attention are the construction of maps and land forms, work with apparatus in performing experiments and the study of specimens and industrial exhibits.

Map drawing is of considerable value in fixing outlines, directions, form, location, and distances, but the sketch map is favored more than the perfect map. The memory sketches compel thought and hence are valuable.

Nearly all schools use local industrial life extensively, visiting factories and shops. The physical features of the neighborhood are also studied by direct observation. In nearly all cases this work is regularly and systematically done.

Apparatus necessary for the teaching of geography in the common

schools consists of maps, globes, modeling materials, (clay, sand, and sand trays), pictures, exhibits and supplementary books.

The combination method is used more than any other one. It avoids extremes and makes close connection between the world and school life. The development method is next in importance. It gives great interest and gets at the real live geography. It uses the reason and covers a broader scope, gathering knowledge from various sources and grouping it around some central idea.

The greatest mistakes in geography teaching are the lack of proper emphasis on essentials, too many useless details, and failure to teach causal relations.

The note-book, sand table and relief map do not seem to be used very extensively in the grades and there are not many people who seem to be much in favor of them.

GEOGRAPHIC INFLUENCES IN THE DEVELOPMENT OF THE MANUFACTURING INDUSTRY OF THE MOHAWK VALLEY

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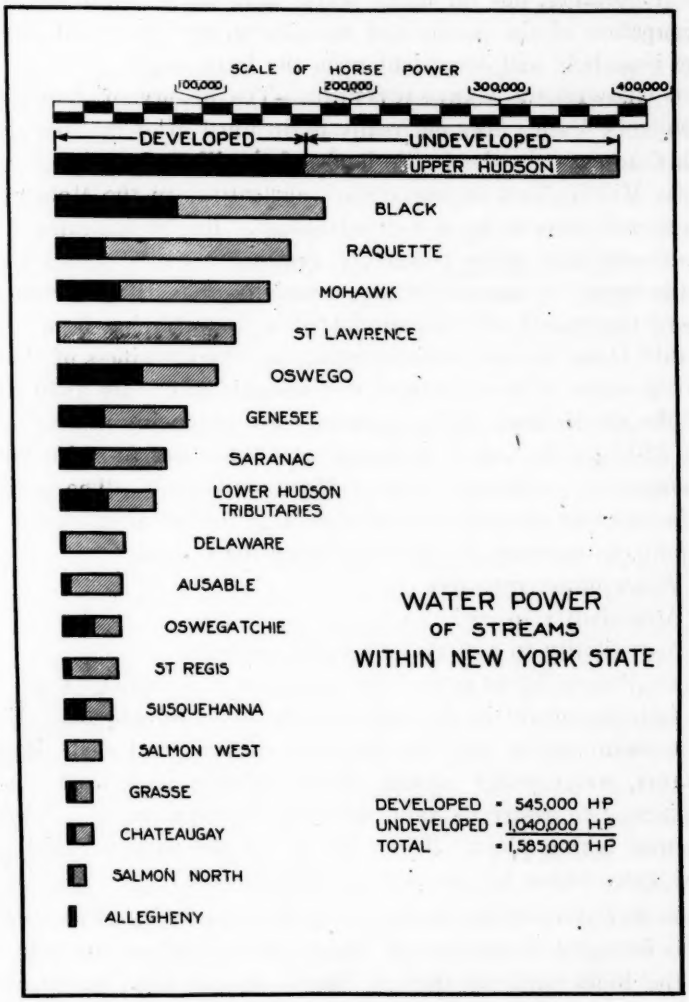
THE Mohawk Valley is one of the busiest manufacturing sections of our country. From source to mouth, there is an almost continuous chain of bustling mill towns along its banks. In these towns are produced fifty-nine per cent. or more of the gloves and mittens made in the United States; nearly half of all the knit goods; ten per cent. of the carpets; and a large part of the cotton goods. Here will be found the largest typewriter works in the world; one of the largest factories for the manufacture of dynamos, motors and electrical supplies; great establishments for the manufacture of locomotives, brooms and broom machinery, firearms, cabinets and furniture, canned vegetables and miscellaneous wares of all kinds, not to mention those manufactures dependent upon dairying—butter, cheese and condensed milk.

A larger proportion of the people of the Mohawk Valley are engaged in the manufacturing industries than are similarly engaged in the city of New York. Taking the six counties that include most of the area of the Valley—Albany, Schenectady, Fulton, Montgomery, Herkimer and Oneida —, in 1907, out of a total population of 527,690 men, women and children, there were 110,428 wage earners in industrial plants, or nearly twenty-one per cent. of the total population. The percentage in New York City for the same year was sixteen per cent., while in the whole state but fourteen and eight-tenths per cent. of the inhabitants were engaged in manufacturing.

The Beginnings of the Manufacturing Industry.—Grist mills for the grinding of grain were in most cases the first mills of any kind to be built, following soon after houses and barns had been erected and a season or two of crops had been gathered. In certain cases saw mills or oil mills for grinding flax seed preceded the grist mill; often the three were combined in one mill. Invariably these were located on some tribu-



tary stream which could furnish power; and such power sites were numerous, for nearly every stream flowing into the Mohawk enters the river with steep gradients, in narrow valleys, and in many cases over water falls.

But aside from these grist, saw and oil mills, early colonial manufacturing was confined to the household. All operations were by hand and

co-operative industry was of little economic advantage. In later colonial days a few new factory industries were added to the list, such as neighborhood fulling and carding mills, hat factories, asheries for preparing pot and pearl ash, and an occasional iron forge. At the close of the Revolutionary War, when a rapid tide of immigration set in from the lower Hudson and from New England, these primitive industries increased in number and importance, but for many years agriculture continued to be the chief occupation of the people and manufacturing remained centered in the farm household and dependent upon the farm crops.

The Growth of Manufacturing.—The history of manufacturing in the Mohawk Valley does not really begin until after the first decade of the 19th Century. As the fertile lands of the Western part of the State and of the Middle West became settled, agriculture in the Mohawk Valley came more and more to be at a disadvantage. But at the same time new inventions, abundant water power and growing markets turned the attention of the people to manufacturing, especially of textiles. From 1810 to the present the growth of the manufacturing industry has been rapid and steady, until it has become, with dairying, the chief business of the people. In 1800 the value of manufactures was insignificant. By 1850 the factories of the six Mohawk Valley counties were producing a product valued at nearly $20,000,000, and in 1900 the total value was $145,000,000.

Geographic Factors Favoring Manufacturing.—The chief geographic factors that have determined this large industrial development during the past century may be grouped under three heads:

1. Water power resources
2. Accessibility to coal
3. Accessibility to raw materials and markets

Water Power Resources.—The presence of abundant water power was especially important in the early history of manufacturing. With the use of the steam engine and the discovery of the great coal deposits of Pennsylvania, water power became of less relative importance, but it is again beginning to assert its value and the development of unused water power is now taking place. The relation of the earliest mill sites to sources of water power has already been mentioned.

Of the New York State rivers within the boundaries of the State, the Mohawk is exceeded in amount of water power development only by the Hudson, the Black and the Oswego Rivers, and in total power available only by the Hudson, Raquette and Black. The total available power of the Mohawk system is approximately 182,500 h. p. of which 42,698 h. p. is developed in one hundred and eighty-eight different plants.

Power Resources of the Mohawk Trunk Stream.—The Mohawk River itself—a mature, well graded stream—furnishes power at but two important localities: at Cohoes, where the river enters the Hudson through

a new channel which it was forced to cut at the close of glacial times, and at Little Falls where, also after the glacial period, the old pre-glacial river flowing westward from Little Falls, was compelled to change its direction and join the Mohawk by flowing over the cliffs of hard rock at that place. Of these two localities Cohoes has much the greater power, both because of the greater fall and because of the increased volume of the river at this point. The river here falls a distance of 105 feet and is capable of furnishing from 12,000 to 150,000 h. p., the two figures representing the minimum and maximum as determined by the volume of water during dry or wet months. The total minimum power of this stream is now developed, it being the largest single water power development in the Mohawk basin. It was because of this power that the knit goods industry was established at Cohoes and has grown to its present large proportions.

At Little Falls the river enters a narrow gorge and, in a distance of one-half mile, falls about forty-five feet, making a possible development of from 2,000 to 40,000 h. p., the present development being 1,844 h. p. Many of the knitting mills here using water power require large steam auxiliary. Water power at present furnishes much the smaller amount of power required for the factories.

The total power developed by the main channel of the Mohawk is 14,336 h. p. or 33.6 per cent. of the power furnished by the entire Mohawk system. Most of this, as shown by the preceding paragraphs, is at Cohoes.

Power Resources of Tributary Streams.—The northern tributaries of the Mohawk take their rise in the high Adirondack region, in the part of the state that receives the heaviest rainfall and that is largely covered by forests. These tributaries are also much longer than the southern. Hence it is that the flow of water in these streams is larger and more regular than in the southern tributaries and that the largest power development has here taken place. Nearly 20,000 h. p. or forty-six per cent. of the power developed in the Mohawk System, are now being generated by these streams. The southern tributaries furnish but 8,600 h. p. With the advent of the factory system, the wide distribution of these water power streams greatly encouraged the establishment of industries and it was along these tributary streams that most of the early factories were built, notably along the Chuctanunda (at Amsterdam), the Cayadutta (between Fonda and Gloversville), the East Canada (at Dolgeville), the West Canada (at Herkimer) and the Saquoit and Oriskany (near Utica).

With the multiplication of mills, however, combined with the diversion of water to the feeders of the Erie Canal and the increased irregularity of stream flow as deforestation went on, water power became inadequate to supply the demand. Either the streams could not furnish power for projected mills, or they were found to become increasingly unable, dur-

ing the summer months, to turn the wheels already installed. Low water records became lower each summer, while floods became more unmanageable. If the Mohawk Valley was to develop its manufacturing industries which it had begun, a new source of power was imperative. Fortunately, such new and auxiliary power was near at hand in the form of coal.

Accessibility to Coal.—The anthracite coal fields of Pennsylvania lie but a short distance to the south of the Mohawk Valley and are readily accessible by way of the Susquehanna River and its tributaries. The distance from Scranton to Utica is about one hundred and twenty-five miles, as compared with one hundred miles to either New York or Philadelphia. From the Scranton-Wilkesbarre Coal fields, the railroads bring the coal up the Susquehanna Valley and there, like the fingers of a hand, they reach into the valley of the Mohawk. In the western part the Ontario and Western reaches Rome and Utica via the Chenango and the Oriskany Valleys, while the Delaware, Lackawanna and Western comes into Utica via the Unadilla and Saquoit Valleys. In the Eastern end of the valley, the Delaware and Hudson reaches Schenectady via the Susquehanna and Cobleskill Valleys. The Lehigh Valley Railroad also reaches the Mohawk Valley lowland just west of the low divide at Canastota. Thus, nearly all the great anthracite railroads closely connect the factories of the Mohawk with the potential energy of the Pennsylvania coal fields, through the passes afforded by these valleys.

Likewise the soft coal of Western Pennsylvania is brought to the Mohawk Valley wholly by rail or by rail to junction points of the coal-carrying roads with the Erie Canal, and thence by barge to the very doors of the factory.

Electric Power.—With the development of electrical transmission of power, the Mohawk Valley is entering a third stage of power utilization in which water, as the ultimate source of power, is regaining its former place. The northern tributaries are a great asset to the industry, coming as these streams do from the high, forest-covered Adirondack region with its abundant rainfall. The creation of the great Adirondack preserve means the perpetuation of the flow of the streams having their sources there; the many lakes act as natural reservoirs, and the topography offers many opportunities for the cheap construction of artificial reserviors. The nearness of the Mohawk to these mountains means rapid fall of the streams as they cross the valley and hence power sites near at hand from which electric power can be distributed up and down the valley. Already East and West Canada Creeks and other streams have been harnessed for this purpose furnishing power and light to Utica, Little Falls, Gloversville and many other manufacturing towns.

Electric power can also be brought to the Mohawk from the large power sites on the Upper Hudson. The cities of the eastern end of the

valley are very near these power centers and even the bringing of such power to a city as far distant from the Hudson as Utica has been seriously considered. The western part of the valley is also well within reach of the power generated at Niagara Falls, Utica, for example, being less than 200 miles from this center.

A possible future source of electric power is offered, furthermore, by the nearness of the coal fields of Pennsylvania. With the generation of electric power at the mine mouth (a development which is already assuming importance), Mohawk Valley towns lie well within the radius of economical distribution of such power.

Judged by power available, the continued growth of manufacturing industries in the Mohawk Valley seems assured.

Access to Raw Materials and Markets.—The third factor that has insured the industrial development of the Mohawk Valley is the ease of transportation, opening the valley to the ingress of raw materials and offering ready means of marketing manufactured goods. The navigable Hudson has brought the sea to the very mouth of the Valley, connecting the great harbor of New York with Troy and Albany. From the head of navigation on the Hudson, access to the interior has been easy, first by river and road, later by canal and lastly by two great railroads and an enlarged canal. Thus, even points as far distant as Utica and Rome, in the western part of the valley, 250 and more miles from the sea, are so connected by land and water with the great seaport at the mouth of the Hudson that it has little disadvantage from its inland position. Likewise to the West, with the great interior of the continent, connection is almost equally easy, bringing, via the Great Lakes, the Erie Canal and the great railroads, the supplies of food and raw materials from that region and furnishing access to a market of unsurpassed excellence. To the north also, via the Black River Valley and the St. Lawrence on the one hand, and the Champlain lowland on the other, communication with the northern part of the state and with Canada is almost equally easy.

Thus the Mohawk Valley is not simply a great highway. It is a center possessing, by virtue of its own resources and its connection with surrounding sections, the conditions that favor manufacturing development. These factors would inevitably have favored some kind of manufacturing. In many instances the particular kind of industry has been determined by some factor other than geographic. Thus the establishment of the glove industry was due largely to the presence of Scotch "glovers" among the early settlers in Fulton County; the knitting goods industry received its start in the Mohawk Valley because of the inventive genius of an inhabitant of Albany; the gun factory at Ilion, because a country boy, unable to buy a gun, succeeded in making a gun barrel at a small village forge. Other industries, as the manufacture of brooms, of lumber, of glass, and

the canning of vegetables, have developed because of the presence of raw materials in the valley. Such industries, however, are relatively insignificant compared with those which receive many, if not all, of the materials of manufacture from distant points. Manufacturing industries have developed in the Mohawk Valley because of unusual advantages of location combined with her own power resources and ready accessibility to the power locked up in the coal of Pennsylvania.

WHY IS BUTTE?

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WHEN a geographer thinks of a city, it is now natural that one of the first questions concerning it should be, why does it exist, or what causes produced it. In attempting to answer such a question concerning the city of Butte, Montana, it may be of interest to point out also how the causes which have produced it have operated to differentiate it from other cities of unlike origin.

Butte was produced by a single industry, and will probably always be supported almost wholly by a single industry. Mining caused the birth and growth of the city, and determined, not only its location, but also its size. Butte is a city of about 50,000 people because about 10,000 men are employed in and about the mines. It is often called "the largest mining camp on earth," and there is little doubt that it is the largest city in the world dependent wholly upon the mining industry. Butte is large because of the concentration of the mining industry at that place. Other mining regions of equal importance are so large in area that a dozen towns are necessary to provide for local needs. The mines of the Butte district produce more copper and also more silver than any area of equal size in the United States. They produce about one-fourth the silver output of this country and the same portion of the copper supply of the world. At the same time they produce notable quantities of gold, lead, and zinc. It is claimed that Anaconda hill at Butte is the richest square mile of the earth's surface, and it is probably true that the value of its yield of metals is greater than that of any other area of equal size.

Butte is an excellent example of a city built and prosperous in spite of the fact that all those external conditions generally thought of as "geographic" are extremely unfavorable. Butte has no natural water supply; it has no natural fuel supply; it has no natural routes for transportation; it has not even a natural food supply. Wood for fuel is brought many miles, and much of that used for other purposes comes from Washington and Oregon. Coal is brought at least 100 miles; much of it comes

from southern Wyoming. All the railroads leaving Butte begin at once the ascent to cross the continental divide, except those running northwest, and these find it necessary to leave the river and climb over the mountains before leaving Montana. Butte is not surrounded by agricultural land; it is surrounded by mountains, and even the intermountain valleys have so meager a rainfall that irrigation is necessary in most places to obtain good crops.

Mining, or the extraction of ores from the earth, must evidently be carried on where the ores are. It is an industry that can not be moved to a place where labor is abundant, or power cheap, or transportation well developed. If the industry is to succeed it means that, so far as they are previously lacking, labor, water, power, and transportation facilities must be taken to the place where the ores are. When mining began at Butte in 1863 all these things were lacking. Now there is no place in Montana which is better supplied with them. A city of laborers has grown up around the mines. A water supply has been brought over the main continental divide from a river about 25 miles away. All the chief sources of water power within a radius of 150 miles have been harnessed to dynamos, and the electric power thus produced has been carried to Butte by numerous heavy copper wires. Finally, transportation facilities have increased until the city is now the chief railroad center between the Dakotas and Spokane, if not between the Twin Cities and Seattle. Five railway systems run into Butte, and another railroad carries most of the ore from Butte to the big smelter at Anaconda.

In contrast with mining, metallurgy, or the extraction of metals from their ores, is an industry that may be carried on anywhere. Consequently, the first copper ores mined in Butte were sent all the way to New Jersey for reduction to metals. Then smelters were built near the mines to recover the metals from the ores. But a smelter uses not only ores but also water, fuel, fluxes, and power. The supply of water of any kind is scanty at Butte, and there is no local supply of fuel, fluxes, or power. Therefore the smelters at the "Copper City" were gradually abandoned in favor of metallurgical plants located near an abundant supply of fluxes as at Anaconda, or of power and fuel as at Great Falls. There have been five smelters at Butte; only one remains, and it is relatively small, and located about two miles from the business center.

Being a city of miners, Butte is characterized by a predominance of laboring men. Some curious consequences have followed largely as a result of this condition. It is inevitable that the crowd on the street or at the circus should be composed chiefly of the working men and their families. For years the labor vote has held the balance of power politically, and recently the same element has elected a Socialist mayor. In the early days the demand for labor was greater than the supply and a high scale

of wages resulted. Labor unions of the various trades have flourished because the labor vote has been so powerful. These organizations derive their strength from the miners' union, which has been conservative, reasonable, and successful. Some of the affiliated unions have been radical and unreasonable; nevertheless, they have usually been successful in their demands. Consequently, the plumbers and bricklayers, for example, are paid twice as much as the miners for work that is no more difficult.

The unions are so strong that union rules are in some respects more important and better enforced than city or state laws. The unions and not the merchants decide how long the stores shall remain open; the unions and not the legislature decide what may be sold on Sunday. When the union decides that certain pipe work done for the county commissioners by plumbers is work belonging to the steam fitters, the commissioners obediently order the pipe taken out and put in again by the men thus designated.

Butte is situated in a mountain valley at an elevation of about 5,700 feet above sea level; it has a remarkably pleasant climate with mild winters, cool summers, and abundant sunshine all the year. But the rainfall is so light that vegetation is naturally not abundant. When the smelters were active their sulphurous fumes killed all vegetation, and the city seemed as if it were located in a desert. It has been suggested that it was as an unconscious protest against this lack of color and beauty that the women of Butte dressed so brilliantly. Elaborate gowns were seen more frequently on the streets in the day time than were seen in the evening in the average Eastern town.

With the removal of the smelters grass and trees have been successfully cultivated in many parts of the residence districts, and the gray granite sands are relieved by patches of verdure.

Another change is now in progress in Butte. The miners heretofore have been chiefly Cornish, Irish, and English. At present these are being rapidly displaced by Hungarians, Montenegrins and Italians. When this change is complete it can hardly fail to change the character of the miners' union, and serious labor troubles may result.

PINES.—About 48 per cent of the total lumber output of the United States in 1908 was pine, showing how important to the lumber industry of the country the 37 species of pine grown in the United States are.

No one species grows in all the states, yet, with perhaps one exception, no state is without one or more. Some occupy large regions in considerable abundance, while others are so scarce that few persons ever see and recognize them. Yet no species of pine is so scarce that it is not made in some way to serve man's need.

TRANSPORTATION IN INTERIOR CHINA

By ELIOT BLACKWELDER,
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WE sometimes forget, in the midst of this age of machinery and railroads, that we are only one or two centuries removed from the day of primitive hand labor, of the cumbersome wagon and sailing vessel. If we look back to the seventeenth century we find our ancestors making use of methods of transportation, manufacture and agriculture which differ only in a minor way from those now used in China. The isolation of the Chinese has prevented them from joining in the great industrial revolution which is going on in western lands. Previous to this sudden development, ten or fifteen centuries had brought very little advancement in the mechanic arts in Europe. China was then undergoing a similar slow development, and has continued somewhat longer along the same path before reaching its point of expression in the present decade.

Except for the innovations of the last few years, the Chinese employ the same methods of transportation and manufacture that were used by many previous generations. All are primitive, according to our western ideas, and all are very slow and tedious. Machinery of any kind is almost unknown in the interior, and the little which they have is laughable to us in its crudity. But, if the signs of the times do not deceive us, these primitive ways are soon to be superseded by modern methods of greater rapidity and efficiency. It may require many decades, yet the change promises to be rapid as compared with the long lapse of centuries which preceded it. In view of this expectation of the awakening of China, it may be interesting to consider in some detail the conditions which the new order of things is to supplant.

In a country so large as China there is of course great diversity of climate and topography, and consequently there are many differences in the means of transportation employed in this province and in that. The densely populated plains, of which we hear so much that we come to think of them as including most of the empire, comprise only one-twentieth of the land. A much larger part, lying principally in southeastern China, is hilly but is capable of supporting a large population in its broad valleys. The northern and western provinces, however, are largely mountainous, and only a scanty number of people live in the deep, rocky valleys. Obviously the modes of travel in these various regions differ greatly according to the conditions.

Among the mountains, pack-animals and men afford almost the only means of transportation. Carts are available locally in the broader valleys, but they cannot cross the rugged passes from one valley to another, and hence the commerce of such regions is largely dependent upon pack-

carriers. The two northwestern provinces, Shen-si and Kan-su, are thus situated. All goods which they import from the rich Yang-tze valley to the southeast are carried across the Tsin-ling mountains on the backs of pack-animals or coolies. Passengers must travel in a similar way. Many ride ponies, while the few who can afford such luxury are transported in "chairs" or palanquins, which are carried by coolies. Traveling by chair represents the acme of comfort, according to the Chinese idea, and is possible only for the official class and the wealthier merchants. There are, of course, no sleeping cars on such a route. The traveler spends the night in a wayside inn or village, after making a day's march of only twenty or thirty miles. The American reader will appreciate readily enough the advantages to be gained by the introduction of railroads into such a country, but, strange to say, the Chinese are not so easily convinced. They are rarely in a hurry, and the discomforts of their own method do not appear to them as such.

Transportation on the backs of men or beasts of burden or by boats laboriously tracked up the rivers are the only means now available in the mountainous provinces of western and much of northern China. In the lowlands of the east, conditions are more favorable, although the means used are in most cases quite as crude.

The wonderful system of canals which forms a network of routes for traffic in the plains of eastern China has been described by many writers. It affords a cheap and safe, even if not a rapid, means of travel throughout the length and breadth of the eastern lowlands. The horde of junks, large and small, which ply their waters, carry millions of tons, both of native and foreign goods, each year. Nor is there any easier or more comfortable mode of travel to be found in China than by boat through these interior canals. Provided one fits out his own boat it lacks nothing but the speed which the westerner demands from carriers in his own country.

Along the river banks at nearly all of the large cities of eastern China, there is a mass of junks and smaller boats so densely packed that the traveler is moved to wonder how each owner ever finds his own boat. The bare masts make a veritable forest around such great cities as Hankou and Canton. As is well known, these junks are used as permanent habitations by thousands of families who spend most or all of their lives in these movable homes. The internal traffic carried on by means of the junks is enormous in volume but has never been reduced to figures. When the wind blows in the right direction, the skipper of the junk hoists the familiar sail strengthened with bamboo slats. But at other times—and these probably seem to the poor coolie all too numerous—the boat must be dragged or "tracked" by the crew wearily tugging at the long hawser made of thin twisted strips of bamboo. In this manner for generations nearly all of the rice used by the Manchu troops and by much of the populace of

Peking has been transported up the Grand Canal from the rice fields of the southern provinces.

On land two vehicles are most in use for both freight and passenger traffic—the cart and the wheelbarrow. The carts are small cumbersome affairs, very heavy in proportion to the loads they carry. This heavy construction has probably been adopted because the roads are so bad that a lighter cart would be shaken to pieces. In western countries local or general governments build and maintain the principal roads, but in China this is not the practice. Until very recently there has been no spark of public spirit among the natives—no appreciation of the fact that what benefits the public as a whole adds to the advantage of the individual. The idea of doing anything for the common good seems utterly foreign to Chinese thinking. Thus it happens that instead of improving roads so that large vehicles may be used and drawn at a fair speed, both the vehicles and the speed are adjusted to the inexorable demands of roads which are usually as bad as they could possibly be.

The great popularity of the wheelbarrow in China is probably due to the fact that a vehicle with one wheel can more easily take advantage of the best parts of the road than one with two; furthermore, it requires no draft animals. The freight-barrow used by the Chinese has a capacity of 600-800 lbs, and, like the cart, is a very stout, heavy machine. It is made of wood throughout. There is no more characteristic noise in China than the incessant squeak which arises from the ungreased axles of the wheelbarrows in town and country. The barrow is not always a one-man vehicle; often a donkey or a mule is hitched to the front of it, after the manner of a plow; and when the wind is favorable the thrifty coolie not infrequently rigs a sail to aid him in his weary struggle with a load which always seems much too big for him. The wheelbarrow as a convenient carrier for small loads about farms and villages is familiar enough in western lands, but in China it is one of the most important means of transporting "through freight," and even passengers. It is not uncommon to see a merchant, returning home from a distant city, riding on one side of a wheelbarrow, while his new stock of goods is packed on the other. There are coal mines in Shan-tung (one of the eastern provinces) whose entire output goes by wheelbarrow to cities and towns 50-100 miles away. In the case of coal, the rapid increase of the freight charges limits the sale to a small district. More valuable commodities are often carried much farther.

At no very distant day, when railroads have been extended widely through the empire, we may expect the most profound changes in the present mode of living among the Chinese. The railroad will not drive out entirely the cart and the barrow, the donkey and the coolie-porter. It will merely supersede them in long distance hauling. Large benefits to the

people will unquestionably accompany this change, and some of these may be pointed out in advance.

It is obvious that the cost of all imported articles in the interior and of exported articles at the coast will be greatly reduced by railway transportation. A more important change is that which will affect low grade commodities such as coal, building stone and grain, which can not now be carried any great distance rfom their sources, on account of the excessive expense of coolie and cart traffic. One of the wonders of American civilization lies in our ability to buy in almost any city the products proper to almost any other part of the country. Here in Wisconsin we burn coal from Pennsylvania, build our public edifices of limestone from Indiana or marble from Tennessee, and buy at moderate cost the bananas of Cuba or the oranges of California.

Such things are not yet possible in China. The coal from Shan-si, carried on donkeys or coolies, is doubled in price every fifteen or twenty miles, and so can have only a local market. For this reason one sees the peasants of the great Yellow river plain burning corn-stalks for fuel in their cooking stoves and making no pretense of heating their houses during winter. Coal is beyond their reach now, but with railroads they might have an ample supply at $2 or $3 per ton.

Building material forms another group of commodities in great demand in China, but now limited to local markets by the primitive methods of transportation. The improvidence of the Chinese, like the reckless extravagance of Americans, has long ago permitted the destruction of the forests, so that lumber has become too scarce to be much used as building material. Mud bricks are the common but unsatisfactory substitute. Of good stone, however, these same deforested mountains could furnish all that would ever be needed. Railroads would carry stone all over the populous plains where it is now too expensive to be used for anything but mill-stones and ornaments. The extension of the use of these two natural products alone would more than justify the building of all the railroads now contemplated in China.

More than any other country, China is subject to famines, especially in the isolated northwestern provinces. The fact depends partly on the lack of free communication between different parts of the empire. In 1900 a severe drought destroyed the crops in Shen-si province and soon reduced three million people to starvation. More than a third of these actually perished for want of food. And yet, at the same time, bountiful harvests were gathered in the eastern and southern provinces. With railroads, supplies could have been imported at moderate cost, and nothing more than a period of "hard times" would have resulted. It would be impossible today to have a famine in Idaho, and yet the topographic situation of Idaho may be well compared with that of Shen-si. The difference in the two cases is largely—railroads.

These examples serve to indicate the sort of benefits which China should receive from the building of railroads. There may be much opposition from the ignorant and the mistaken among the natives, and there may be periods of halting and even retrogression in the process, but the overwhelming advantages of the railroad over other means of transportation on land will eventually crush out all objections in China, just as they did in England in Stevenson's time.

COMMERCIAL BRAZIL

(From *Commercial America*)

BRAZIL has an area of 3,218,000 square miles, or nearly as much as all the rest of South America, and 200,000 square miles more than the area of the United States, exclusive of Alaska.

Brazil is thinly populated, having about 21,000,000 inhabitants, or about 80 per cent. as many as all the rest of South America. New York, Pennsylvania and Ohio combined have as many inhabitants as all of Brazil.

The language of Brazil is Portuguese, while that of all the rest of South America, excepting the Guianas, is Spanish.

The Portuguese made their first settlements in Brazil as early as the year 1500, and the country continued under Portugal until 1822. It was the last of the South American countries to become a republic. In 1891 it adopted a constitution similar to that of the United States, and each of the provinces was made a state with an independent state government as in the United States.

On account of the large exports of coffee and rubber, Brazil has for a long time been one of the most important countries in South America from a commercial standpoint and is now second only to Argentina in the total value of its foreign trade.

The value of the imports and exports is given in the following table:

Year	Imports	Exports	Excess of Exports
1901	$ 96,175,000	$194,965,000	$98,790,000
1910	235,574,000	310,006,000	74,432,000

More than one-half of all the imports came from Great Britain, Germany and the United States.

Great Britain supplies nearly all the coal and three-fourths of all the cotton goods. It also leads in the imports of iron and steel and machinery. Germany leads in the imports of arms and ammunition, cement, leather and paper. The United States leads in the imports of mineral oils, resin, turpentine and electrical apparatus. France leads in butter, drugs and chemicals. Argentina leads in flour; Uruguay, in jerked beef; Belgium, in rails.

During the last ten years the imports from the leading nations have increased as follows, values being given in millions of dollars:

	1901	1910	Increase		1901	1910	Increase
	Millions of dollars				Millions of dollars		
Great Britain,	30	67	37	Argentina,	13	20	7
Germany,	9	37	28	Portugal,	6	13	7
United States,	12	30	18	Belgium,	2	10	8
France,	7	22	15	Italy,	4	7	3

The value of the exports from Brazil in 1910 was $310,000,000, or more than in any preceding year. Over one-third of this was the value of the exports to the United States and nearly one-fourth that of the exports to Great Britain, so that 60 per cent of all the exports was sent to these two countries.

During the last ten years the value of the exports to the leading nations has increased as follows, values being given in millions of dollars:

	1901	1910	Increase		1901	1910	Increase
	Millions of dollars				Millions of dollars		
United States,	84	112	28	Netherlands,	9	15	6
Great Britain,	25	73	48	Argentina,	4	11	7
Germany,	29	36	7	Austria,	5	9	4
France,	23	26	3	Uruguay,	2	5	3

For over fifty years Brazil has produced more coffee than all the rest of the world. The increase in the world's production has been in Brazil and mainly in the Santos district. A comparison of the exports of coffee from all producing districts during the five years 1900-1904 with that of 1905-1910 shows that, while the Santos district increased its output nearly eight million bags, the output in all other districts, either in Brazil or elsewhere, decreased.

Export coffee was distributed as follows:

	Value Millions of Dollars		Value Millions of Dollars
United States,	58.8	Great Britain,	2.8
Germany,	16.1	Argentina,	2.5
Netherlands,	14.8	Italy,	1.7
France,	8.9	Other countries,	12.9
Austria,	8.7		
		Total,	127.2

Brazil is also the largest exporter of rubber, more than one-half the world's supply coming from that country.

The distribution of rubber in 1910 was as follows:

	Millions of Dollars		Millions of Dollars
Great Britain,	57.9	France,	12.4
United States,	47.4	Germany,	4.2

Heretofore the United States has been first in the exports of rubber from Brazil, usually taking more than half the production. Para, heretofore, led in the export of rubber, but Manaos is about to take the position of first place from Para.

In 1910 the third place among the exports from Brazil was held by Yerba maté, a tea used mainly by the people of Southern Brazil, Argentina and Uruguay.

The exports of cacao in 1910 fell off 10 million pounds. During the years 1907, 1908 and 1909, Brazil produced more cacao than any other country. The enormous increase in the production of cacao in Ecuador and St. Thome in 1910 made them rank first and second, causing Brazil to fall from first to third rank.

France and Germany, as well as the United States, decreased their purchases of cacao, while Great Britain and the Netherlands increased them.

In 1910 there were 24,552,000 pounds of cotton exported. Most of it is shipped from Pernambuco, which supplies about 50 per cent of the total exports. Great Britain takes 90 per cent of the cotton exported from Brazil.

There were 129,412,000 pounds of sugar exported.

As will be seen from the above agricultural products are the mainstay of Brazil. In coffee and rubber it leads the world and in some years has had first rank in cacao. Rice is now being cultivated in sufficient quantity to reduce the import of it. Cotton, for which some parts of Brazil seem well suited, should be developed in order to take advantage of the steadily increasing demand for the raw cotton in Europe.

A loss of more than 10 per cent in the domestic freight tonnage shipped between ports on the Great Lakes during August of the present year is shown by the monthly figures of lake shipments. These shipments totaled 11,600,000 short tons, compared with 13,000,000 short tons in August, 1910, and 12,500,000 short tons in August, 1909. Assuming that the relative losses for the succeeding months of the present season, as compared with last season, will not exceed the losses for August, the 1911 domestic freight shipments on the Great Lakes are not likely to exceed 72½ million short tons, as compared with 86,700,000 short tons in 1910 and 81,000,000 short tons in 1909. The total domestic lake shopments for the 8 months of the present year aggregated about 19 per cent less than in 1910. Of the total loss of over 10.7 million short tons about 10.3 million short tons represent the loss in iron-ore shipments alone.

INTERESTING ISLANDS OF THE SEA—PORTO RICO

By J. B. HAGBERG,
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PORTO RICO is one of the most valuable tropical possessions of the United States. It is some 1400 miles from New York and reached by steamer from New York to San Juan in about 5 days. From San Juan, P. R. to Havana, Cuba, is a distance of about 1000 miles.

The island is roughly rectangular, 100 miles in extent from East to West, while 36 miles is about the average distance from North to South. Of the 3600 square miles, very little is level. The northern and eastern slopes are well watered the year round, as the prevailing northeast trades leave their moisture there, but long periods of drought are frequently experienced on the south side. This fact has made necessary the irrigation project now well under way. It is proposed to tunnel through the mountains at several favorable places and divert some of the water of north-flowing streams to the fields on the south. As a matter of fact, much has already been done.

Much of the dry land on the south side is given over to grazing, so more cattle and horses are raised on the southern side than on the north.

Although the island is extremely hilly, transportation and travel are made possible by a network of very good roads. The principal road is the "carretera" from San Juan, on the north coast, to Ponce on the south, about 80 miles in length. A trip over this road by carriage or automobile is one of the delights of the traveler, as more picturesque scenery would be hard to imagine. An altitude of about 2500 feet is reached at one point along the way.

The last Federal census gave Porto Rico a population of over 1,000,000 inhabitants; in round numbers, 300 inhabitants per square mile. For a strictly agricultural country the population is dense. The principal centers of population are naturally found along the coast. San Juan, the capital, has a population of over 50,000. Ponce has about the same number.

The racial mixture in Porto Rico is of every degree, from a mere trace of black to a type where the African characteristics predominate. Besides the negro element, and the European, there is also found a survival of the Carib Indian, the aborigine of the island. The percentage of all white is undoubtedly small, limited to families whose immediate ancestry came from Europe at a comparatively recent date. Judged by the number of males of voting age who declare themselves illiterate at the polls, and have their ballots marked for them, the percentage of illiteracy in Porto Rico is high.

Under the present American regime there is carried out a policy of

universal primary instruction. Every town and "barrio" of any size is provided with a school of some sort for primary instruction. All the larger towns have good school buildings, and in many of them the instruction is carried on almost entirely in English. The larger cities have high schools, and there is a normal school at Rio Piedras. An elementary school of agriculture is to be established. The insular government also grants a number of scholarships to students who wish to pursue work in the States.

Porto Rico is entirely an agricultural country, with sugar as its staple article of export. The growth of the sugar industry has been phenomenal since American occupation. The value of raw sugar exported during the past year was over $25,000,000. Tobacco and coffee are also exported, the former to the United States, and the latter almost wholly to Europe. Many American planters are engaged in raising pineapples, grape fruit and oranges for the American market. All fruit is shipped to New York. There has been a very marked advance in the cost of living to everyone since American occupation. Wages, however, have advanced, and no doubt the general standard of living has been raised.

The social side of life in Porto Rico centers around the "casinos" or social clubs, usually to be found in every town of any size. The favorite form of social diversion is the dance, frequently held on Sunday evenings, as Sunday is primarily a day for diversion. Every town boasts of its "plaza," where it is customary to go on Sunday evening to hear the band concert.

The peculiar form of government and the political status of the Porto Rican has caused no end of debate and consequent division into parties and factions. At present the Porto Rican is not an American citizen, nor is he a citizen of any other country. Neither is he entirely self-governing, as the upper house of the legislature (combining both executive and legislative functions) is appointive. Newspapers, both pro and anti-American in sympathies exist, and politics are usually at fever heat. On the whole, however, the affairs of government run smoothly, and Porto Rico is enjoying a measure of material prosperity never before experienced.

NOTES ON SOUTH AMERICA

(Largely extracted from the *Bulletin of the Pan-American Union*)

THE years 1910 and 1911 mark the centennial years of independence throughout Latin America.

Among the Republics whose celebrations took an active form were Chile, where a month was devoted to national and international festivities; Mexico, with somewhat similar displays of national enthusiasm, and Co-

lumbia, where the centennial spirit was quite as marked, although the Government decided to restrict public participation in it to national confines. Ecuador had celebrated its own centennial in 1909, in accord with its local history, but it joined with other Republics in the Latin-American feeling; Paraguay announced the official celebration for the year 1911; and Venezuela, while acknowledging the year of 1910, preferred to postpone its festivities until 1911, the centennial anniversary of the declaration of independence. Argentina's celebration consisted of a series of expositions to illustrate various phases of progress, by no means the least important of them being the railways and land transport exhibit.

A number of expeditions have been projected or already started by the United States scientific bodies into the interior of South America, for the purpose of simple exploration, or of collecting exact data on scientific and commercial conditions. In Panama a biological survey of the Canal Zone is in progress, the result of which will interest students and business men alike. In Venezuela two expeditions, and in Columbia one, began work in 1910. Others, especially those of Prof. Bingham for Peru and Mr. Muir for the Amazon River, were planned during that year, but were not ready until in 1911. In the Lower Amazonian region an expedition from the United States for zoological exploration received the support of the Brazilian Government, and the same Government has agreed to contribute a substantial sum for an extensive trip of investigation through the Republic to be made by the English traveler, Henry Savage Landor. Other expeditions of similar character have been in operation in Central America and Mexico.

ARGENTINA.—Agriculture continues to be the greatest source of national wealth. Wheat claims the largest acreage, alfalfa second, and corn third, and flax fourth, among the crops grown. Though ranking eighth among the wheat raising nations, Argentina ranks second in the amount of wheat exported. Argentina has a vast acreage and a small population and hence exports a very large proportion of her farm products. The United States exports only about 15 per cent. of the wheat which it grows, while Argentina exports 80 per cent. Not more than 20 per cent. of the land available for wheat in that country is employed for it and ⅔ of that is poorly cultivated. Serious injury to crops (from drought and enormous swarms of locusts) is much more common in Argentina than in the United States.

Argentina is becoming one of the world's large exporters of corn (100,000,000 bu. in 1910) and the cheapness of land there permits the production of corn at considerably lower cost than is possible on our farms. Animal products form the other great source of wealth, and make up 40 to 45 per cent. of the exports. All of the animals were originally introduced from Europe. "At one time, when the natives were exceedingly

hostile, a few horses and asses were abandoned on the pampas and from such stock have descended the innumerable herds that today cover the almost limitless plains." Though a great producer of corn, Argentina raises relatively few hogs.

Large farms (1,000 to 6,000 acres) are common. Modern machinery, much of it made in Chicago, is used.

The most productive parts of the republic are excellently supplied with railroads, largely built with English capital. The railroad mileage has increased 1000 per cent. in 30 years.

The Parana River is used for an immense traffic, reaching into Paraguay and Brazil. Regular steamer communication is maintained between Buenos Ayres, Asuncion, and Corumba, Brazil. Although much further advanced than most South American countries, Argentina is still an undeveloped country, and its population is about equal to that of New York or Pennsylvania, though its area is more than half that of the United States. The lack of coal, iron and available timber is a serious drawback.

BRAZIL.—This is one of the giant nations in area, but has a population of only 6.4 to the square mile (21,000,000 people in all). Immigration into Brazil is much less rapid than into Argentina and less rapid than a decade ago. While a million immigrants enter the United States in a year, only 85,000 to 90,000 enter Brazil.

The trade of the United States with Brazil is very large, but unbalanced. We buy four or five times as much in value from Brazil as we sell to her. This is a most exceptional case in our foreign trade. Of course coffee is the great crop of Brazil and Americans are the greatest consumers of coffee in the world.

Brazil buys more than twice as much from the United Kingdom as from us and a quarter more from Germany than from us. At least three reasons underlie this: there is far better steamer service from Europe than from the United States; English and German goods usually cost less and they are packed better; English and German exporters have organized the business better than we have. We buy nearly half of all the coffee exported from Brazil. The United Kingdom takes more of the rubber than we do. The two nations together taking four-fifths of the product. Argentina takes ⅔ of the exported yerba maté or Paraguayan tea, and Germany takes the major part of the hides and tobacco.

The coffee of Brazil is practically all produced in a small area back of Rio Janeiro and Santos, from which ports it is exported. A large part of the railroad mileage is in this region, and most of the very limited manufacturing is done here.

The republic has iron deposits of enormous wealth but has neither the capital nor the men to develop the mines. Foreigners, particularly Americans, are now undertaking the work. Since coal for smelting the

ore is lacking, it must be taken to the United States or Europe in the form of ore. The production of gold and diamonds, once so important, has declined toward a vanishing point. The water front of Rio Janeiro is among the most beautiful and imposing of any harbor in the world.

URUGUAY.—This little country is growing into considerable more importance than its size would suggest. The great industry is the raising of live stock on the grassy plains. There are 25,000,000 sheep and 8,000,000 cattle. Less than 1-20 of the land is cultivated and still less is forest covered; the rest is pasture land. There are 1,400 miles of railway,—more by far than Columbia or Venezuela has. The one large city is Montevideo, growing rapidly. Few nations are so completely pastoral. The live stock products reach over $40,000,000 annually while agricultural products do not reach $3,000,000. The annual value of hides and skins produced is four times greater than the value of all the grain produced.

VENEZUELA.—The total foreign trade of Venezuela in a year amounts to less in money value than the output of steel products by the United States Steel Corporation in two prosperous months. All of the railroads in the country put together would reach from Chicago to Denver. Coffee is the largest crop with cacao and rubber second and third. The value of the exports of the three combined for a year about equals the cost of milk for New York City for six months. In an area equal to the British Isles, Germany and France combined it has somewhat more than the population of Paris.

BOLIVIA.—Bolivia depends mainly upon her mineral wealth which includes nearly all known metals, widely distributed and very abundant. While the exploitation of these metals is carried on on a considerable scale, yet, due to lack of labor, capital, and adequate transportation facilities, they are not fully developed, and in many cases remain untouched. The tin, copper, and bismuth mines of Bolivia are among the richest of the world; she is now producing about a quarter of the total tin output of the world. This metal is rather limited in distribution on the earth's surface; the Malay Straits country, the Island of Banka, a limited area in India, and Australia, with Cornwall, England, and Bolivia are the few places where it is found in sufficient quantity to make exploitation profitable.

A considerable impetus has been given the exploitation of coal in the Copacabana Peninsula on the Bolivian side of Lake Titicaca, the deposits of which could, according to official estimates, yield 40,000 tons annually.

Next to tin the most important product of Bolivia is rubber, the annual export value of which is estimated at $4,000,000.

The Antofagasta & Bolivia Railway runs through some of the finest Andine scenery in South America. The main line is carried to a height of 13,000 feet above sea level, and one of its branch lines reaches the

great altitude of 15,809 feet. A regular line of steamers is maintained on Lake Titicaca, situated at an altitude of 12,000 feet and having an area of 4,000 square miles, being thus not only the highest steam-navigated lake but also one of the largest lakes on the American continents.

COLOMBIA.—All or very nearly all the emeralds mined today come from Colombia. And, in spite of the supposed higher value of diamonds, the emerald is the most precious of gems. Carat for carat, a flawless emerald would bring perhaps three times the price of a flawless diamond in the jewelry market.

The peculiar geographic features of Colombia have rendered the construction of railways very expensive and difficult. There is as yet no continuous railroad system within the Republic but there are many short lines at present engaged chiefly in local traffic, which, when their plans are fully carried out, will connect the coast on both the Atlantic and Pacific sides with the centers of production.

ECUADOR.—Ecuador has a treasury of wealth in her vast cacao groves. Cacao is cocoa. It is also chocolate. The cacao bean must not be confused with the coca, the plant of Peru which yields a leaf chewed by the Indians for its stimulating properties due to the cocaine content; nor with the cola nut of West Africa, which resembles it in a slight degree chemically; nor yet with the cocoanut, to which it has no relation. The cacao tree is indigenous to Mexico, Central America, and part of South America. The tree was originally a wild evergreen, growing from 16 to 40 feet high and bearing a cucumber shaped pod 5 to 10 inches long in which the seeds lie buried. The seed, which is the raw cacao of commerce, resembles a thick almond in size and shape. When ripe the pods are cut from the tree and gathered into heaps on the ground where they remain a day or two before they are judged fit to be cured. The process of curing is an extremely delicate one and to a great extent determines the flavor and quality of the finished product.

Another unique industry in Ecuador is the export of vegetable ivory. The fruit of the tagua palm furnishes this product, which has proved to be an excellent substitute for the elephant tusk ivory. The tree grows wild along the west coast of South America where the natives gather the fruit, taking those nuts found on the ground which are matured. These nuts bring $2.00 to $2.50 per hundred pounds in Guayaquil. The principal use of the product is in the manufacture of buttons. The average annual export from Ecuador is 20,000 tons.

The type of hat commonly known as the "Panama" was originally manufactured in Ecuador, where it passed under the native name of "jipijapa." But a President of the Panama Republic set about encouraging the cultivation of the shrub which furnishes the straw for the hats, imported weaving teachers from Ecuador, established a school, and so en-

couraged the "infant industry" that today Panama has every right to stand godfather to the hat. It is a mistake to suppose that the high price of Panama hats is the result of the cost of the special straw of which they are made. In fact, high import duties and commissions account for the prohibitive prices of the ordinary good article when purchased in the United States.

The total extent of railway lines in operation in Ecuador is 350 miles. The Guayaquil and Quito line, constituting a greater part of this mileage, completed the construction of its road from Guayaquil to the capital on June 25, 1908, and since that date trains, both passenger and freight, have been running regularly between the two cities. The regular passenger trains run only during the day and make the trip (297 miles) in two days, when formerly, by mules and on foot, it was not uncommon to require 12 to 15 days in going over the same route.

CHILE.—Chile has three great productive zones, in some ways quite distinct from each other. In the extreme south, adjacent to the Strait of Magellan, is a newly developing region well suited for sheep and similar pastoral industry, but showing also mineral possibilities. The central portion of Chile possesses the famous Central Valley, one of the garden spots of nature. Here all the products of the temperate zone and most of those of the sub-tropical climate, grow luxuriantly, and it is by far the most thickly settled and highly cultivated section of the Republic. In the north lies the third zone, which appears to be barren, sterile, and worthless, but which in reality, by reason of the nitrate found there, has been the source of much of the wealth of the country. The nitrate or saltpeter zone embraces an area in the north of Chile of about 450 miles from one end to the other. The deposits of the mineral do not lie close to the coast, but are separated from the sea by an interval varying from 15 to 93 miles, and they are always at an altitude of from 3,600 to 13,000 feet, in a barren and waterless plain. It is estimated that, allowing for probable increase in the rate of consumption, there is a sufficient quantity for at least 50 years.

Coal mining is the next most important industry of Chile; it is the only country in South America in which coal is, as yet, commercially mined with regularity, and therefore able to supply local consumers directly. The total consumption of coal in 1910 was about 2,270,000 tons, of which almost 1,000,000 was mined in Chile.

PERU.—The sources of national wealth in Peru are mining and agriculture, with mining in the first place. The total annual mineral output of the country is valued at about $25,000,000. Copper occupies the first place with silver second. Silver to the value of over seven thousand million dollars has been mined in the country since its discovery. That is the record of the Western World—enough silver dollars to circle the earth

nearly seven times, if the coins were laid edge to edge around the globe.

The working of the guano deposits of the Republic constitutes another important branch of industry, and within the last 18 years the Peruvian Corporation has extracted a third of the 3,000,000 tons allowed under its contract.

BOOK REVIEWS AND NOTICES

HANDBUCH DER KLIMATOLOGIE. By Professor Julius Hann. Three volumes. Third revised and enlarged edition. 8vo. Stuttgart, 1908-1911. Engelhorn.

A teacher in any branch of science must of necessity make occasional reference to text-books of recognized standing for authoritative information regarding obscure points in other departments of knowledge than his own. It is important, therefore, to know what are the latest and best books in which such information should be sought. There are few teachers of geography who do not, at some time or other, wish to look up certain details regarding the climate of this or that special portion of the earth's surface. The universally acknowledged authority on all climatic matters is the *Handbuch der Klimatologie* of Dr. Julius Hann, Professor at the University of Vienna, the third edition of which, in three volumes, is now complete. Of these three volumes, the first deals with general climatology*; the second, with the tropics, and the third with the temperate and polar zones. There is no book which in any way whatsoever approaches this monumental work. The author is the acknowledged master of his science. He has summarized, and discussed critically, the latest climatic data for all parts of the world. And he has furthermore written a book which is neither dry nor difficult to read. The carefully selected quotations from writers who are personally familiar with the conditions which they describe, and the frequent references to the relations of climate and crops, and climate and human life, serve to enliven and to make interesting what, in less skilled hands, would have been three volumes of dull and tiresome tabulations. Teachers who have occasion to refer to Hann's *Handbuch der Klimatologie,* may be sure of finding compact summaries and descriptions of climates all over the world, with abundant bibliographic references, complete up to May, 1911, in the case of the third volume. The fact that the work in its final edition is in German only is, of course, a serious disadvantage. But certainly most of the tabulated data will be intelligible to those who have not any great familiarity with German, and the excellent geographical index makes it possible to "run down" the data for any special locality with great ease. R. DeC. WARD.

*The first volume of the second edition was translated into English by R. DeC. Ward (8vo. Macmillan, 1903).

THE ICE AGE IN NORTH AMERICA. By G. Frederick Wright. Fifth Edition, Revised and Enlarged, Oberlin, Ohio, 1911, Bibliotheca Sacra Company, $5.00. Postage, 25 cents.

Among American geologists Professor Wright was almost the first to go directly to the glaciers themselves for information to aid in the interpretation and explanation of the glacial deposits and drainage of the United States. As early as 1886 he visited and studied Muir glacier in Alaska and later made glacier studies in Greenland and other parts of the world. The first edition of this work was published in 1889 and it has had a deservedly large circulation. The new edition which is completely revised and greatly enlarged, contains over seven hundred pages of text and numerous illustrations. Portions of the discussion of the probable cause of glaciation and of Lake Agassiz are by Dr. Warren Upham. There are chapters on the glacier in general, glaciers of different parts of the world, the work of ice in erosion, transportation, and deposition, the cause and date of the glacial period, man and the glacial period, and a full bibliography.

CHARACTERISTICS OF EXISTING GLACIERS. By William Herbert Hobbs, New York, 1911, Macmillan Company, $3.25.

This book has an introduction dealing with the ancestry of glacial theories, the factor of air temperature, mountain versus continental glaciers, and low level versus high level sculpture, following which are the three main parts of the book dealing somewhat fully with mountain glaciers, Arctic glaciers, and Antartic glaciers. L. M.

INDUSTRIAL GEOGRAPHY OF WISCONSIN. By James A. Merrill, Superior, Wis., State Normal School. Published by The Laurell Book Co., Chicago and Des Moines, (1911). Seventeen chapters, 182 pages, 109 illustrations.

Professor Merrill has written an excellent little book, suited either to the teacher's or the pupils' use and of interest to the general reader. A considerable physical geography is introduced in the chapter on The Building of Land Masses, The Building of Wisconsin, The Work of Glaciers, Soils and Ground Water. The Industrial Geography is chiefly found in the chapters on Industrial Development of Wisconsin, Principal Industries of Wisconsin, Transportation and Principal Industrial Centers. The little volume seems to be rather a general geography than simply an industrial geography. The illustrations are excellent and the little maps showing distribution of forests and of various products are valuable. Both Elementary School teachers and High School teachers will welcome the book.

FROM WESTERN CHINA TO THE GOLDEN GATE. A little book of 128 pages and 30 illustrations, written by Roger Sprague, an American university graduate, and published (1911) by Lederer, Street and Zens Co., Berkeley, California. (85 cents). R. H. W.

A VALUABLE GOVERNMENT REPORT

"Statistical Record of the Progress of the United States, 1800-1911" is the title of a small document just issued by the Bureau of Statistics, Department of Commerce and Labor. It pictures in statistical form conditions in the commercial, financial, industrial and transportation systems of the United States at brief intervals since the year 1800, down to, and in many instances including the year 1911. In those cases in which the subjects considered are measured by Governmental fiscal year periods, the figures for the fiscal year 1911 are included; in those in which calendar year periods are used, of course, statements can only terminate with the calendar year 1910.

Among the interesting facts shown are that the area of continental United States was 843,255 square miles in 1800, advancing to 1,734,630 square miles in 1810; to 2,995,536 square miles in 1850; and 3,026,789 square miles in 1853, since which date no change in area is shown. The population, which was 5⅓ million in 1800, was 93¾ million in 1911. Public debt, which was 83 million dollars in 1800, reached 2,675 million dollars less cash in Treasury in 1865, the figures of 1911 being 1,015 million dollars. The per capita debt, which was $15.63 in 1800, and in 1865 $76.98, is in 1911 $10.83. The interest charge per capita, which amounted to 64c in 1800, and $4.12 in 1866, was in 1911, 23c, and the total annual interest charge, which was in 1866, 146 million dollars, was in 1911, 21⅓ million dollars. Money in circulation, stated as 26½ million dollars in 1800, was in 1911, $3,228,627,002, and the per capita circulation, which was in 1800 $4.99, was in 1911, $34.35. Deposits in all banks in the country cannot be shown earlier than in 1875, at which date they are set down as a little over 2 billion dollars, and in 1910, over 15 billion dollars. The number of depositors in saving banks in 1820, the earliest year for which the figures can be shown, was a little less than 9 thousand; and in 1910, over 9 million. Government receipts, which amounted to $2.04 per capita in 1800, were in 1866, $14.65, and in 1911, $7.45, or about one-half what they were in 1866. Exports of domestic merchandise which amounted to 32 million dollars in value in 1800, were over 2 billion dollars in 1911; and imports, which amounted to 91 million dollars in 1800, were 1½ billion in 1911.

Many other subjects of this character stated by the document in question, include details of imports and exports by great groups and grand divisions, and principal ports through which shipped; the production of principal articles, such as wheat, corn, cotton, coal, sugar, copper, etc.

Copies of the publication in question can be obtained by applying to the Bureau of Statistics, Department of Commerce and Labor.

QUESTIONS ON THE UNITED KINGDOM

1. Latitude? Same as what part of North America? of Asia?
2. Compare in area with that of some of our large states.
3. Account for the remarkably mild climate.
4. Are any other regions in the same latitude equally mild? Explain.
5. The isotherms of the United Kingdom run nearly north and south. Account for it.
6. Why has the United Kingdom rather heavy rainfall? Why not heavier? Consequences?
7. What caused these lands to be islands? Reason for your conclusion?
8. Account for the estuaries; the fiords; the low altitude of the mountains.
9. Where are the mountainous parts? Effects of these mountains in the history of the islands?
10. The United Kingdom has the greatest colonial empire, greatest foreign commerce, greatest merchant marine, greatest navy, in the world. Show the inter-relation among these facts. Why has it a relatively small army?
11. The United Kingdom is a great manufacturing nation. Reasons?
12. Our foreign trade is largest with the United Kingdom; nature of that trade?
13. Name and locate the chief British colonies. Which are especially valuable for commercial reasons? Explain. Which for military reasons? Why?
14. What is the nature of England's trade with each of her more important colonies? Show reasons and mutual benefits.
15. Where in the United Kingdom are the important coal and iron mines?
16. Is there any advantage in the location of these mines? Explain.
17. Where are the manufacturing sections? Why there? Chief manufactures?
18. Of the commodities purchased of us, what ones are of greatest annual value? Explain causes.
19. One-third of England's population, above ten years of age, is engaged in manufacturing and only one-tenth in agriculture. Probable causes? Consequences?
20. Name five important ports and show any advantage of location in each case.
21. Name five manufacturing cities. In what line does each specialize?
22. Suggest reasons why the United Kingdom is not holding her own as a manufacturing and commercial nation? What nations are her chief rivals?

POPULATION OF CONTINENTAL UNITED STATES, BY STATES, 1910, WITH NUMBER AND PER CENT OF INCREASE, 1900-1910.

STATE.	Population 1910	Increase from 1900 to 1910.	
		Number.	Per cent.
NEW ENGLAND	6.552,681	960,664	17.2
Maine	742,371	47,905	6.9
New Hampshire	430,572	18,984	4.6
Vermont	355,956	12,315	3.6
Massachusetts	3,366,416	561,070	20.0
Rhode Island	542,610	114,054	26.6
Coonnecticut	1,114,756	206,336	22.7
MIDDLE ATLANTIC	19,315,892	3,861,214	25.0
New York	9,113.614	1,844,720	25.4
New Jersey	2,537,167	653.498	34.7
Pennsylvania	7,665,111	1,362,996	21.6
EAST NORTH CENTRAL	18,250,621	2,265,040	14.2
Ohio	4,767,121	609,576	14.7
Indiana	2,700,876	184,414	7.3
Illinois	5,638.591	817,041	16.9
Michigan	2,810,173	389,191	16.1
Wisconsin	2,333,860	264,818	12.8
WEST NORTH CENTRAL	11,637,921	1,290,498	12.5
Minnesota	2,075,708	324,314	18.5
Iowa	2,224,771	* 7,082	*0.3
Missouri	3,293.335	186,670	6.0
North Dakota	577,056	257,910	80.8
South Dakota	583,888	182,318	45.4
Nebraska	1,192,214	125,914	11.8
Kansas	1,690,949	220,454	15.0
PACIFIC DIVISION	4,192,304	1,775,612	73.5
Washington	1,141,990	623,887	120.4
Oregon	672,765	259,229	62.7
California	2,377,549	892,496	60.1
*Decrease			

STATE.	Population 1910	Increase from 1900 to 1910.	
		Number.	Per cent.
SOUTH ATLANTIC	12,194,895	1,751,415	16.8
Delaware	202.322	17,587	9.5
Maryland	1,295,346	107,302	9.0
District of Columbia	331,069	52,351	18.8
Virginia	2,061,612	207.428	11.2
West Virginia	1,221,119	262,319	27.4
North Carolina	2,206,287	312,477	16.5
South Carolina	1,515,400	175,084	13.1
Georgia	2,609,121	392,790	17.7
Florida	752,619	224,077	42.4
EAST SOUTH CENTRAL	8,409,901	862,144	11.4
Kentucky	2,289,905	142,731	6.6
Tennessee	2,184,789	164,173	8.1
Alabama	2,138,093	309.396	16.9
Mississippi	1,797,114	245,844	15.8
WEST SOUTH CENTRAL	8.784,534	2,252,244	34.5
Arkansas	1,574,449	262.885	20.0
Louisiana	1,656,388	274,763	19.9
Oklahoma	1,657,155	866,764	109.7
Texas	3,896,542	847,832	27.8
MOUNTAIN DIVISION	2,633,517	958,860	57.3
Montana	376,053	132,724	54.5
Idaho	325,594	163,822	101.3
Wyoming	145.965	53,434	57.7
Colorado	799,024	259,324	48.0
New Mexico	327,301	131,991	67 5
Arizona	204,354	81,422	66.2
Utah	373,351	96,602	34 9
Nevada	81,875	39,549	93.4
Continental United States.	91,972,266	15,977,691	21.0

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